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JUG

Publication of the Northern California Contest Club

NCCC

55 Years of Contesting Excellence

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NCCC MEETING
https://nccc.cc/meetings.html

23 Nov, 1pm-4pm,
Blue barn,
819 Grant Ave
Novato, CA 94945

President's Report

David West, KO6M

I've been super quiet the last few weeks, ero posts on the reflectors and almost zero lengthy replies to those of you that write to me. First, don't worry, I'm still here, I've just devoted the last month to work. Like do actual work. My apologies. I've missed you all. I've missed the contests and the discussions too.

With that said, I had a beautiful email from a member pointing me towards a W1DED presentation with the Black Swamp Radio Clubs' own KE8UTX and KE9QJV. Look at those call signs, you already know how new they are. However, is that bad? No. Not at all. It means they want to be involved and help keep our hobby relevant. If you haven't seen the video, I urge you to check it out. It's one of the few YouTube videos you'll find me recommending.

Next, my turn to gripe. It seems one of our radio manufacturers decided to jump on the "Software as a Service" model. Saying the software in your radio is only up gradable with a paid subscription method. I know, they have had that in place already with their 2.x to 3.x cost. I know there are other companies in other

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industries that charge for software upgrades. However, for those of us that come from an industry where software upgrades are free as long as the hardware can support the software, it's a tough pill to swallow. It's interesting that of all the things we talk about on the reflector, we haven't chosen to talk about this latest decision. Does that mean more of our operators are on the other platform already? (Or of course on non-SDR radios?).

I think what gets me even more is the response to a service ticket that I have open with this company. "This problem has all the hallmarks of a PA that is failing. The radio itself is over 7 years old. The last time the radio was serviced in 2023, only the fans were replaced." It was that straw that helped me say the proverbial good-bye to Flex (oh, I wasn't going to name names, my apologies). Don't tell me the age of my radio (it was bought as a preloved radio, so to me, it's younger than that) and say it hasn't been serviced in 2 years. Are they saying their radios need to be sent in for service like cars? They said that to someone that has seen their own product sit unserviced for decades and still purr like a kitten. Some of you have radios that still work without issue after years. I expect my "7" year old radio to do the same. Silly me. So with that said, anyone want to buy a used 6400 that may need to be serviced so it can output full power again?

We have the wonderful ARRL Sweepstakes (SSB Version) coming up very soon. How did you do in the CW ? What did you do to get past the Sunday factor? We had a great discussion going on the reflector. What is interesting to me is that so often contesters don't want change to contests. It messes with the records and such (or so I'm told). However, in this one, you all have some great ideas. Keep it up and keep bringing your thoughts to the organizers. Without your passion for the sport it will cease to exist. Keep up the hard work!

After ARRL SS, we have Northern American Sprint SSB, CQ World Wide DX CW, and ARRL 160 to name a few. Lots of activity as we head into the holidays. I hope you can find quality time to get on the radio!

As you may have noticed, our November meeting is a little late, but it's in person! Victor has those details coming soon. November 23rd is the date! (Yes, during Sprint, we did what we could, but sometimes we have to work with what we have.)

December will be back on Zoom. We may do a concentration on ARRL 10M one last time before we have that contest the weekend of December 13th-14th.

K9YC Seeks Sweepstakes Input

For those who do not follow the NCCC email list closely, Jim, K9YC, who doubles as our division representative on the ARRL Contest Advisory Committee, is seeking ideas and discussion on potential changes to the ARRL Sweepstakes to improve its attractiveness

and participation. ARRL SS is one of, if not the oldest, continuously active contests in ham radio ... right in there with Field Day, said to be a non-contest. SS has undergone a great deal of change so more won't be new. It was first run in 1930, involved sending and receiving radiograms with text], scored one point for sending and one for receiving, and ran for two (2) weeks.[1] It allowed contacts with all the states plus Cuba, Puerto Rico, and the Philippines which were then US possessions, and the term “bands” was somewhat flexible then so work a station once wherever you could find him.

Today, it runs twice each year in November [CW and Phone], each for most of a weekend, and has some rules that differ significantly from the mass of other contests, including the exchange which has shrunk to just a radiogram-like preamble but still has five parts. Expound to Jim at *k9yc@arrl.net* with your comments and ideas. CO and DU no longer count in SS and it's doubtful they will return.

1 Keep in mind that continuous waves were still replacing damped waves [spark] in the mid-20's. Completing QSO's was a lot harder then.

Upcoming State/Province QSO Parties

Thanks to WA7BNM

https://contestcalendar.com/stateparties.php

The next State/Province QSO Party is Vermont, in Feb 2026

State/Province	Dates/Times
Vermont	1 Feb 0000Z to 2 Feb 2400Z

Larger Contests on the Horizon

JIDX Phone	8 Noa 0700Z to 9 Nov 1300Z
ARRL Sweepstakes – SSB	15 Nov 2100Z to 17 Nov 0300Z
NA Sprint – SSB	23 Nov 0000Z to 0400Z
CQ WW DX – CW	29 Nov 0000Z to 30 Nov 2359Z
ARRL 160	5 Dec 2200Z to 7 Dec 1600Z
ARRL 10	13 Dec 0000Z to 14 Dec 2359Z
RAC Winter	27 Dec 0000Z to 2359Z

Weekly CW (1 hr) Events

ID	DAY	UTC	EXCH	WPM	SPONSOR
SST	Fri	2000 - 2100	Name+SPC	<20	K1USN
	Mon	0000 - 0100			
MST	Mon	1300 - 1400	Name+QSO#	20-25	ICWC
	Mon	1900 - 2000			
	Tue	0300 - 0400			
CWT	Wed	1300 - 1400	Name+CWO # or Name+SPC	20->∞	CWops
	Wed	1900 - 2000			
	Thu	0300 - 0400			

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ID	DAY	UTC	EXCH	WPM	SPONSOR
	Thu	0700 - 0800			

Thursday FT4 NCCC Sprint

The Northern California Club is again pleased to sponsor our weekly FT4 Sprint, aka FT4NS (NCCC Sprint). This contest is held every Friday UTC between 0100Z and 0130Z (Thursday evening in North America). Non-North American stations are welcome to participate. No logs are necessary; please submit your score to 3830scores.com using the "NCCC FT4 Sprint" template. FT4 NS Sprint Rules are posted at: https://www.ncccsprint.com/ns.html See you on the screen! Frequencies: 1839, 3575, 7047.5 (also 7080), 14080, 21140, 28180, 50318.

NCCC Board Announces 2025-2026 Focus Contests

David, WD6T

The Officers and BoD of NCCC, after much discussion, have decided that the following contests will be "focus contests" for the 2025-2026 contest year:

*** ARRL 10 meter contest – 13-14 Dec 2025**
*** CQ WPX RTTY contest – 14-15 Feb 2026**
*** CQ WPX SSB contest – 28-29 Mar 2026**
*** CQ WPX CW contest – 30-31 May 2026**

If this sounds familiar, it's for many of the same reasons:

All of these are "everyone works everyone," which lends itself to higher rates and a higher fun quotient

All of these have club competitions

We chose ARRL 10 meters two years ago to take advantage of the solar cycle peak. We also shifted the plaque program to ARRL 10m. This may possibly be the last good year of 10 meters, so enjoy it while it lasts!

We chose the three WPX contests because we like the scoring rules which are more fair for the West Coast. Scores increase geometrically as a function of "butt in chair."

We also sponsor several plaques related to these contests:

Two special California plaques, one for top California WPX CW+SSB and another for top California WPX CW+SSB+RTTY

The WPX CW Zone 3 HP CW plaque

The WPX RTTY USA Club plaque

As these contests get closer, we will be doing presentations on tips for operating these contests, including propagation data from previous years, and how to maximize your score.

Please keep in mind that there are other contests that we will also promote, even if they are not technically "focus contests," in which clubs compete against each other. In particular the North American QSO Parties and the Sprints are fun team competitions. We will continue to form teams and have a major presence in these contests.

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Additional Photographs From “Americans On Everest”

(Ed. Note: Bill, N6ZFO, submitted four photograps with his book review of “Americans On Everest in the Oct issue of the JUG. I was able to use two of them but had technical difficulties getting the other two formatted properly before time ran out. I've since managed to beat them into submission and stay on the page where I put them, with a small reduction in quality, and present them here.)

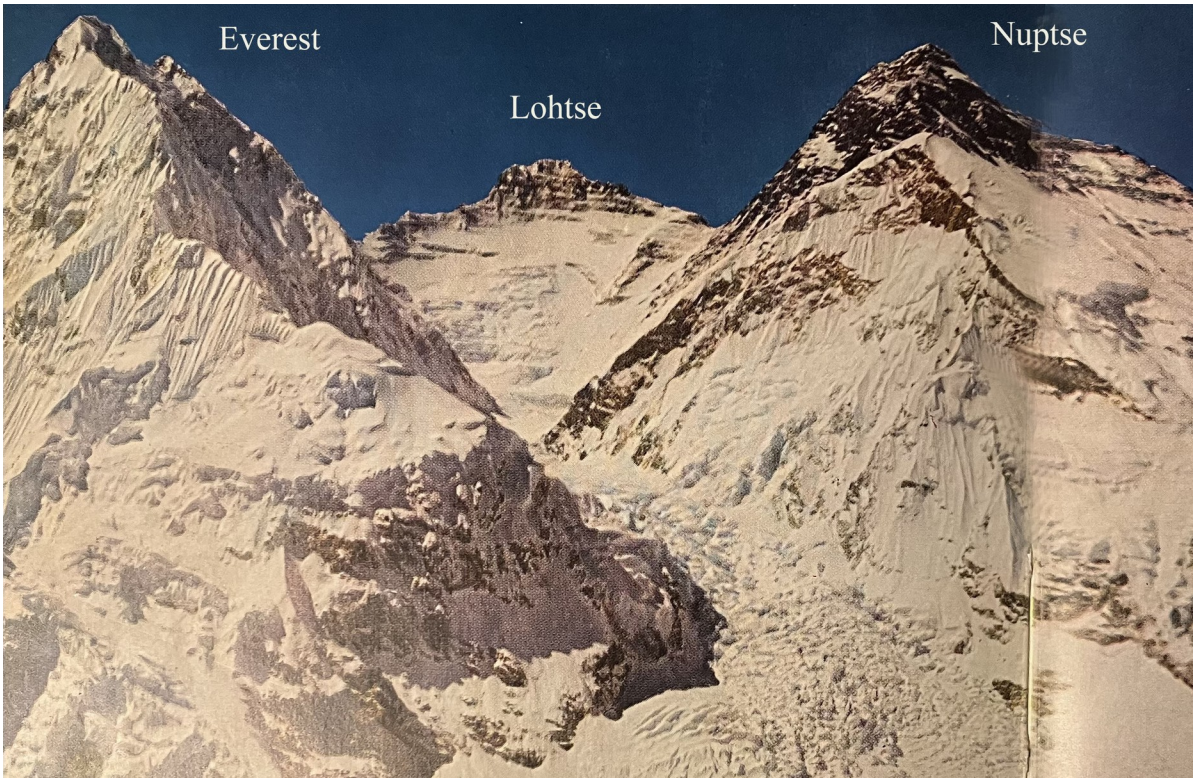

Figure 2. Picture of Mt. Everest, Mt. Lhotse and Mt. Nupste, “Americans on Everest,” after page 136.

Figure 3. U.S. members of the Dyhrenfurth climbing team, "Americans on Everest," after page 72. W0DI is in the first row, second from the left.

Tube of theMonth

Norm Wilson, N6JV

Visit the Tube Museum at *n6jv.com*

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In the March, 1921 issue of QST, RCA announced that they had added their first CW power tube to their post war lineup. The UV-202/C-302 had construction that was similar to their others tubes with short pins and a brass base. It was rated at 5 watts output. The first 202 tubes I ever found had their bases removed. This was a common practice to get a tube to operate at higher frequency as it reduced capacity.

In the October, 1925 issue of QST, RCA announced several new tubes including the UX-210/C-210. The new tube was called a 7 ½ watter and it had the new UX base. That base had long pins and was made from baklite plastic. The plate voltage for transmitting was 425 volts at 60 ma. When used as an audio amp in a receiver, 90 to 157 volts could be used. The filament voltage was 7.5 volts in a transmitter and 6 volts in a receiver. The mu was 7.7 which made it a better oscillator then the UV-202 was. By 1929 the ARRL Handbook didn't list the 202, but almost every transmitter circuit featured a UX-210 as an oscillator or amplifier sometimes using several parallel tubes.

With an effective monopoly on tube production in 1929, RCA was in control. Control was lost in the early 1930's when the courts broke the game open when they allowed other makers to build tubes using the RCA patents. Soon production was started at Sylvania (210), Raytheon (RK-10), Taylor Tubes and others. RCA made the 10 in a different envelope and designated it a 10Y. It was also known as a VT-25-A and was used as the speech amplifier in the WWII BC-375 transmitter that was incorporated in the B-17 bomber and other mobile and fixed applications.

Today these small triodes are all collector's items but audio enthusiasts have made a big market for them.

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The Lumber Yard

Awards and Kudos for NCCC Members

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More Lumber Yard

Awards and Kudos for NCCC Members

Bill Maurer WB6JJJ
NCCC 5 Meg Award

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Yet More Lumber Yard

Awards and Kudos for NCCC Members

Jack, W6FB/4

plus [photos not available]

101 WU6P Nian Li

102 N6IE Ron Castro

103 N3RC Roger Cooper

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Summits on the Air

A New Source of Young Contesters?

By Roberto, K6KM

The Perspective

What would attract a young, new ham to contesting? Ask long-time club members, and the answer is often: *"Field Day!"* Of course, that was back when radio was *the* technology of the era. In the 1950s and 60s, ham radio was booming. Listening to shortwave broadcasts from distant lands – and then making contacts yourself was thrilling!

While researching the history of my local club [LARK (Livermore Amateur Radio Klub)] I discovered that when color TV arrived in the 1960s, many hams drifted away to the couch to watch family shows. The ham station took a back seat, and in fact, LARK went on hiatus during that decade after years of vibrant activity.

The next surge came in the early 1970s, fueled by RF power CMOS devices. Suddenly, 2-meter and 70-centimeter handy-talkies appeared, and operators could walk around with a "communicator" in hand – super cool once again! Repeaters brought a wave of new operators, and setting up a mobile rig with a phone patch meant you essentially had a *phone in your car!* But then came the cell phone and internet revolutions. Now everyone had a "radio" smaller than an HT, could talk anywhere for free, and no license required. So, what comes *after* all that? How do we get a young person excited about ham radio today—especially about contesting?

SOTA and POTA: The New Frontier

Among all the modern branches of amateur radio, one stands out for attracting new and younger operators: **SOTA – Summits on the Air.** Although there are no formal age statistics for SOTA, a look at any SOTA campout paints a clear picture. You'll find:

Young, energetic, and tech-savvy operators,
Middle-aged hams who enjoy the peacefulness of operating outdoors, and
Retirees who stay fit and mentally sharp through their activations.

In SOTA, there are two main roles: The **Activator** climbs the mountain and calls CQ and the **Chasers** contact the activators from home or elsewhere. Both earn points based on the mountain's elevation.

Mountain Goat — 1,000 activator points.

Shack Sloth — 1,000 chaser points.

There are about 13,500 activator**s** and a similar number of chasers worldwide in the

SOTA database. More than 20% of Mountain Goats are YL's.

How does this differ from POTA (Parks on the Air)?

POTA operators can operate from inside their vehicles, often using full 100-watt stations powered by their car whereas SOTA activations may not be attached to a vehicle. POTA activations also tend to be easier access with with phone contacts being the norm. SOTA, by contrast, demands light gear, self-sufficiency, and skill, a recipe that attracts innovators and experimenters.

The First Step: Getting on the Air

Many new SOTA participants begin with a 2-meter FM HT. It's simple and portable, and since they're on a summit, they'll have good simplex range. But soon they discover its limitations. Up in the high country, where the big points are, making the required four contacts on VHF/UHF for activator points can be tough. No repeaters are allowed (except satellites), so even line-of-sight to a city far away may not help much since simplex VHF is not a common mode. That's when many activators realize that, to succeed, they need to upgrade to General or Extra and move into HF operation.

The Second Step: Going QRP

Unlike their POTA counterparts, SOTA activators quickly learn that carrying a 100-watt rig and large battery to the summit isn't practical. The solution? QRP. But running low power introduces new challenges. Unless propagation is very good, making four SSB contacts with 5 W and a wire can be a struggle—especially when bad weather looms and you are in a hurry. Then comes another realization: most summit-to-summit (S2S) contacts are made using **CW**. Without it, you're missing half the fun.

The Third Step: Learning CW

Eventually, most SOTA activators decide to take the plunge into Morse code, through CW Academy, one of the web-based study options, or just by sheer persistence and practice. That's when the magic begins and operating CW from a quiet, RFI-free mountaintop is a revelation. The band sounds alive. After self-spotting, a pileup forms within seconds. At first, it's chaotic—but soon, the new CW operator learns to manage the rhythm, peeling off calls, improving technique, and reveling in the thrill. By the time they hike back down, they're replaying every QSO in their head. The excitement is contagious.

The Contesting Step: From Peaks to Pileups

What comes next? *"How can I have even more fun?"* That's where contesting enters the story. Operating from a well-equipped contest station offers hours of excitement without the physical strain of hiking or setup. And since most contests happen on weekends, there's still plenty of time during the week to chase summits or plan the next activation.

Shared DNA: The Technical Spirit

Contesters are known for their technical creativity and station optimization—and so are SOTA activators. Here are just a few examples of SOTA ingenuity:

Brian, AB6D — Solving the No-Cell Service Problem: Brian began as an SSB-only operator and faced a common issue: how to get spotted from remote peak with no cell coverage. CW operators have it easier – the RBN network can detect their signals automatically and "RBNHole[2]" connects these to pre-posted SOTA alerts, spotting them instantly. But for SSB? No such system exists. So Brian created SOTAMat – an app that works completely offline. You select your summit, frequency, and mode, and the app encodes your call and activation info into a short FT8 tone sequence. Just play the tone near your rig's mic on 14.074 MHz, and your signal is picked up by PSKReporter. From there, an automated system decodes and posts your spot online. You can even request local weather or other data—all over FT8! Now a CW operator himself, Brian still uses SOTAMat and even developed a Wi-Fi hotspot for the Elecraft KX2 that transmits FT8 directly through frequency-shifted CW. No cables, no wind noise – just pure innovation.

Adam, K6ARK — The Miniaturist: Adam is famous for shrinking his gear and making it as light weight as possible. His 49:1 End-Fed Half-Wave transformer fits directly onto a BNC connector—and yes, he's even built a 100-watt version.

N6ARA — Tiny Tools for the Trail: N6ARA designs the world's smallest paddles and other trail-friendly accessories for QRP operators. Perfect for emergency or minimalist setups.

Quansheng CW Hack: Quansheng, a budget Chinese HT has been hacked to unlock HF bands and, amazingly, enable CW on 2 meters. It requires a straight key (no internal keyer yet), but activations have already been made with bugs and cuties. At recent SOTA campouts, it's become tradition to bring Quanshengs for 2 m CW summit-to-summit contacts!

Conclusion: A Pathway to the Future

Our ham population is aging rapidly. Contesting thrives on participation, excitement, and energy – but to stay alive, it needs *new* operatorsand SOTA provides a natural pathway. It cultivates technical skills, operating discipline, and self-reliance. It's social, physical, and fun – and the thrill of managing pileups from a mountaintop translates perfectly to contesting. In fact, several new NCCC members in recent years have come directly from the SOTA community—bringing with them the energy, curiosity, and innovation that keep

2 A number of years ago, Eric June, KU6J (SK), developed software he named "RBNGate" that extracted RBN data and posted it to SOTA Watch, the online location for posting activation alets. This meant that getting spotted by RBN automatically updated SOTA Watch information. RBNGate software was lost after Eric's death but Ryan, VK3ARR reverse engineered the concept and developed a substitute. Seeing his efforts as somewhat crude compared to RBNGate, he named it "RBNHole" … a "hole" being much more crude than a proper "gate". RBNHole has evolved, the name has stuck.

amateur radio alive.

“SOTA may well be the next great source of young contesters”

Results of the 40th NCCC Sprint Ladder Competition

Vic DiCiccio VE3YT

Bill Haddon’s report on the 39th NCCC Sprint Ladder earlier this year recognized a new record of 66 participants. Traditionally the Ladders have been counted using Roman numerals, and I’m happy to report this latest Ladder has lived up to its XL designation with 71 participants. It was held on six Thursday evenings from August 4th to September 11th, with the goals of whipping up interest and honing skills for the four-hour North American Sprint CW Contest on Saturday September 13. The best four of a possible six reported scores were counted for each participant.

Several top contesters consider the NCCC Sprint to be their favorite weekly activity, and perhaps their favorite activity in all of ham radio. The 100 watt maximum, the QSY requirement and the use of six bands in 30 minutes all complicate the strategies regulars use. Many use two radios, but it is difficult to really interleave QSO elements and at least one frequent top-scorer, K7SS, uses a single radio. Scores grow exponentially and some poor decisions early in the half-hour can cost you, but people often report they started slow then had a good night. Detractors describe the NS as chaotic, yet participants say they can feel everything is “in sync” when they are on their way to a good score. It’s the kind of event where you can learn new skills after a decade, and surprise yourself with new ways to screw up. On 3830 many comments are a variation of “it wasn’t my night,

but I sure had fun", or "there's always next week", or "for me that was a really good score." Recently Greg NA8V reported the top score of over 3,400 and said, "Next week finally came!"

During the Sprint Ladder things are amped up just a little. There are a few more participants than normal, and the CW speeds increase. There are more callers, a little more QRM and a bit faster pace. This Ladder had quite good propagation almost all six nights, with 15m open for all but one night. There were some new participants and regulars who showed improvement.

Results

In the Atlantic division W2RQ took the lead early, then had challenges in Weeks 2 and 5. In the "best of four" calculation, Bill took first with Lar K7SV and Howie N4AF close to each other. Looking at the aggregate of the best four scores ("High 4"), Bill W2RQ also had the top result of all divisions in the Ladder. (Note that the average column in the tables is the average of all reported scores, not the average of the best four.) Overall there were 15 participants, plus one week for Jim K8MR while visiting his daughter. It was nice to have A.J. NK4O and Steve KO4VW, who have become NS semi-regulars, joining us for Ladder XL.

Atlantic

Call	Class	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Average	High 4
W2RQ	LP	3828	2365	2668	2773	1564	2679	2646	11948
K7SV	LP	2900	2451	2193	2736		2288	2513	10375
N4AF	LP	2793	2655	1950	2565	2009	2040	2335	10053
N3QE	LP	2016	1702	2296	2067	2132	2064	2046	8559
W1FJ	LP	1845	1147		1184	1152	1620	1389	5801
K4BAI	LP	1330	999		725	1020	928	1000	4277
K8CN	LP	1440			1462	1116		1339	4018
N3SD	LP			952	952		960	954	2864
K3MM	LP				1320		1221	1270	2541
N6ZFO	LP	870	648		418	600		634	2536
NK4O	LP	672	700	841				737	2213
KO4VW	LP				520	1102	504	708	2126
AJ1DM	LP	506					621	563	1127
W1WEF	LP						588	588	588
K8MR	LP						266	266	266
K2SX	LP		56					56	56

The East Central division had three top scorers all fairly close: Mike W9RE, Greg NA8V and Bob KW8N. Mike missed the first week and Bob missed Week 4, so it took a while for the standings to settle to reflect their final positions. There were 22 participants, compared to 21 in Ladder 39. Congratulations to Cathy Goodrich W4CMG, whose best score was more than 1.5 times her best in the last Ladder. Cathy is the Board President of SKCC and teaches Essential Operating Topics twice a week in the Long Island CW Club. In retirement Cathy has held local, regional and national roles as an American Red Cross volunteer and received the US Presidential Lifetime Achievement Award in 2023.

East Central

Call	Class	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Average	High 4
W9RE	LP		2585	2623	2436	2288	2530	2492	10174
NA8V	LP	2530	2050	2464	2058	2576	2538	2369	10108
KW8N	LP	2585	2279	2623		2552	1665	2340	10039
VE3YT	LP	2346	1672	2279	1824	1764	1862	1957	8311
W8WTS	LP		1960	2310		1786	1840	1974	7896
K9BGL	LP	2156	1584		1794	1645	1880	1811	7475
K8MR	LP	1935	1054	2214		1628		1707	6831
K1GU	LP	1360	1540	1584	1794	1302		1516	6278
W4NZ	LP	1320	1218	1715		1189	990	1286	5442
N8EA	LP		2040				2376	2208	4416
N4DW	LP	986	1008		825	1496		1078	4315
N7ZZ	LP		1152	775	864	1218	980	997	4214
N8EA	QRP			950	1178	1080		1069	3208
WQ5L	LP	1050		1120				1085	2170
KY0Q	LP	837	598		572			669	2007
W1NN	LP			1800				1800	1800
W4CMG	LP	156		154	224	272	598	280	1250
N9TTK	LP		1023					1023	1023
K0EJ	LP			924				924	924
AA9RK	LP					357		357	357
VE3INE	LP	64	49	1	110	64	16	50	287
K8APP	LP	9						9	9

New to the Ladder and relatively new to the NS

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in the East Central division are: Carson “Car” K8APP, who learned about the NS in Cathy’s Essential Operating Topics LICW course, and Mary Lim VE3INE, licensed in 2023, whose first QSO on HF was with Cathy. Mary VE3INE is a piano teacher and harpsichordist who became involved in ham radio because of CW, and it’s a great week when we give each other the ON multiplier. Some NS regulars who only did one week of the ladder include Hal W1NN, Justin N9TTK, Mark K0EJ and Mike AA9RK.

The West Central division was led again by Art KZ5D in Louisianna. Art seems to be

West Central

Call	Class	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Average	High 4
KZ5D	LP	1886	2142	2184		1872	2585	2133	8797
N0AT	LP		1435	1320	1020	1887	1551	1442	6193
K0VBU	LP	1840	980	1080	1287	1485	1419	1348	6031
N3ZZ	LP	525	1050	1280	1140	1015		1002	4485
N5OT	LP	1184		1248	936		775	1035	4143
K0TG	LP	1221	1015	832		891	864	964	3991
AI6O	LP	1224		510		483	1428	911	3645
N5RZ	LP				1620	1548		1584	3168
W0BH	LP				1496		1344	1420	2840
N0AC	QRP						399	399	399

everywhere in NS. People report they often work him first or are called by Art when they move down early to a new band, yet I’ve often found Art late on a higher band for the LA multiplier. Close in second and third were Ron N0AT and Bill K0VBU. Overall participation was down a bit in West Central, from 13 in the Ladder 39 to 9 this time. Scores also seemed to suggest conditions weren’t as good in that region for this Ladder and maybe that affected participation. It’s wonderful to be joined by Mark N5OT who reported scores for four weeks of the Ladder, and by Gator N5RZ for two weeks.

NCCC in CA/NV

Call	Class	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Average	High 4
WD6T	LP	2173	2832	2288	2622	1665	2646	2371	10388
AJ6V	LP	1978	1665	1610	2100	1968	1716	1839	7762
N6TTV	LP	650	1178	651	990	1360		965	4179
KM9R	LP	832	850	952	744	690	945	835	3579
K6NV	LP			506	690	768	864	707	2828
N6WM	LP	361						361	361
K6KM	LP				336			336	336

The NCCC in CA/NV division grew from five to seven. Dave WD6T, Ed AJ6V, Carl “CJ” N6TTV and Mike KM9R finished in the same order as Ladder 39, with Dave WD6T comparing well with the top High 4 scores in other divisions. Bill N6ZFO, one of the five in the Ladder 39, is now in Virgina in the Atlantic division. Compared to last time, new in this Ladder were Bob

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K6NV, reporting four scores, and Chris N6WM and Roberto K6KM reporting one week each.

The West division, along with CA/NV, enjoys great activity on 15 and/or 20 as the NS begins. Dan K7SS reported five good scores with a significant lead on Dick K4XU, closely

West

Call	Class	Wk1	Wk2	Wk3	Wk4	Wk5	Wk6	Average	High 4
K7SS	LP		2610	2928	2420	2835	2622	2683	10995
K4XU	LP	2376	1540	2494		2891	2009	2262	9770
N5ZO	LP		2142	2184	2679	1800	2295	2220	9300
WJ9B	LP	1989	2142	2332	2279		1739	2096	8742
N9RV	LP	2576	1900	2352				2276	6828
VE6RST	LP	1116	1170	1248	1230	1184	1209	1192	4871
N6TR	LP			3100		440	868	1469	4408
KI7Y	LP	858	891	1073	1015	1312	896	1007	4296
N0TA	LP			1209	693	800	1312	1003	4014
AH6KO	LP	891	840	567	832	999		825	3562
NN7SS	QRP	672	875	837	621	910		783	3294
AA7V	LP	1840		1404				1622	3244
WU8T	LP		456	550		616	360	495	1982
K7SS	QRP	1927						1927	1927
N0AC	LP	456	143	648	304	414		393	1822
N7VS	LP	16		238	480	288		255	1022
AH7RF	LP	49	16		256	225	210	151	740
N6HI	QRP	72	72		154	48	140	97	438
K7WA	LP					224		224	224

followed by Marko N5ZO. Will WJ9B followed in fourth and newcomer (returner?) Pat N9RV submitted three scores to earn 5th place. This division had 18 participants compared to 14 in Ladder 39, including regulars Stan AH6KO, Steve AA7V and Bill N0AC (who was in West Central division last time.) Welcome to Jim K7WA who got on for Week 5 and more recent NS sprints. Another “new” participant, who started NS in the last two weeks of the previous Ladder, is Dr. Heather Flewelling AH7RF. Heather is an astronomer at the Canada-France-Hawaii Telescope, and has discovered her own comet, named after her, as well as watching for asteroids that can potential impact earth. She does the NS either from home using Low Power, or QRP portable from a park convenient to her workplace. Heather not only helps decrease the average age of NS participants (along with semi-regulars Justin N9TTK and Chad N9UNX), but with Cathy W4CMG, Mary VE3INE and Amanda KY4GS (in 2024) there have now been four YLs participating after many years.

The next North American Sprint is Saturday February 7th, so the NS Advisory Committee will soon plan the dates for Ladder XLI (41), perhaps straddling the NAS to avoid starting

the Ladder during the holidays. There are two new members of the NCCC Sprint Advisory Committee: Heather AH7RF and Tim Shoppa N3QE, who has graciously agreed to join the Advisory Committee after years of tabulating the Ladder scores from our weekly 3830 reports. Thank you for doing this Tim, including your efforts to do a second round to mop up any straggler scores posted on 3830 in the hours after the NS.

Congratulations to all the top scorers and to everyone who enjoyed participating in Ladder X!

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Connector Weatherproofing

"Everyone Has an Opinion"

Gary, NA6O

As a regular reader of TowerTalk and a few other online ham radio groups, I have watched in wonder as dozens of fellows expounded on their favored method of weatherproofing coaxial connectors. As they say about opinions, everybody has one... and everyone else's stinks. There were some really amusing methods, but eventually I detected a consensus that also aligned with some published recommendations.

(The table below summarizes what I found. Column headers are the various materials, and in each cell is the sequence in which they might be applied, starting with number one as the base layer.)

Source	Vinyl tape, Scotch 33/88	Scotch 33/88, sticky side out	Silicone tape (e.g. Rescue; Scotch 70)	Self-fusing tape 3M 2155, 2242, 130	Liquid Elec Tape	Heat-shrink	Double-wall Heat-shrink	Skotch-kote	Coax Seal	PTFE Tape	Mastic
DXE TechTip, NK7Z, W0QT, WJ4X, W9FX	2			1							
K2ASP				1							
W6SX			1								
ARRL, K4IA	1,3			2							
K4ZA	3			2						1	
W6XU	3	1		2				4			
W2IRT				1		2					
W3LPL	3	1		2							
K6EWN	2		1					3			
K9YC, NA6O, KL7UW, NF4L	2		1								
N4XY	2			1	3						
KL7UW				1			2				
NM5G	1,3							2			
WW5L	1							2			
NI1N	1								2		
AC0H	1,4			3				5	2		
VE7RF	1,3						2				
W4NGU	1				2						
N9LS	3	1									2
Comm. tech							1				
AB7E							2			1	
K5UJ	*										

* Nothing. Just a rain roof.

The wackiest one starts with “a coating of silicone grease, wrap with a trash bag, then apply vinyl tape but NEVER use 3M tape because that's no good. And by golly, it's the BEST way and I've been using it for 40 years and no other way will ever suffice.” I left that one off the chart.

Most of us in NorCal have it easy with our mild weather, and more than a few get away with nary so much as a quick wrap of electrical tape. Still, some kind of weatherproofing on your connections will likely improve long-term reliability and make those connections easier to maintain. And if you're setting up shop in the Caribbean, you really need to get this right.

Three Layers

The consensus points to a three-layer system. First is typically vinyl tape, acting as a release layer or courtesy wrap, which aids you when it comes time to remove the tougher upper layers. (Some skip that one.) Second is a self-vulcanizing, sealing layer. This is the critical one that provides the primary moisture seal. Finally, an outer layer of vinyl tape protects the more vulnerable sealing layer from the sun and abrasion.

Everyone recommends 3M Scotch Super 33 or the heavier 88 vinyl tape, those being known quality products. Not much more to say about that choice. A double wrap is usually applied as the final layer and it has a very long service life. *Tip:* Cut it, don't tear it, and it's less likely to "flag" in the wind.

As for the self-vulcanizing layer, there are several popular choices. First are the various self-fusing rubber tapes, also known as splicing tape. 3M makes several types (such as 2155, 2242, 130C). All of these are available at Home Depot and are perfectly acceptable for our purpose. Note that two of these actually have a UV resistance specification and it's possible to use them without an overwrap.

2155: 30 mil. Has a clear liner strip.

2242: Premium grade. UV-resistant, 30 mil. No liner strip. Easier to use!

130C: Similar to 2242 but additionally rated for high-voltage applications.

The second choice is silicone rubber tape. Examples are Rescue Tape, F4 Tape, and countless others, available everywhere. This material doesn't really stick to the substrate, but bonds well to itself. Like the rubber tapes, it's very stretchy and provides an excellent moisture seal. Also it comes off very easily when touched by a knife. Because of its poor cut resistance, it really needs an overwrapping.

The third choice for a sealing layer is what the commercial boys often use, butyl rubber mastic. It comes as a rolled-up sheet on a removable liner. You basically mold it around the connector. Examples are 3M 2212 (available from DXE and online suppliers), and Andrew (Commscope) 42615-4 as part of their weatherproofing kit p/n 221213. Note that this material does not turn to permanent disgusting slime like CoaxSeal!

Dielectric Grease

Another enhancement that you'll see on commercial connectors that I learned about while dealing with all sorts of military stuff is a careful application of silicone dielectric grease. The material I'm talking about is Dow Corning 4 Electrical Insulating Compound. Get it at Amazon. You apply a tiny amount to connector threads—just a film—and also to the male and female contact areas. The less you use, the better it works. It is highly water repellent, and that's the reason for its use here. Any moisture vapor that makes its way through to the connector will stop when it hits this material. Also it acts as a lubricant for the threads and does not break down in the presence of high voltage. And no, it does not effect electrical conductivity in properly-assembled connectors.

Tighten Up

Before mummifying your connection, be sure those connectors are truly tight. PL259s have a couple of little bumps on their faces. Those mate with small notches in the SO239 sockets. Make sure those are engaged, then spin the shell on. Those faces are where the shield connection is actually made, not through the threaded shell. Then use pliers to snug it up a bit beyond hand-tight. (But please go easy and don't chew up or crush the shell.) The last thing you want is a deeply-hidden intermittent connection. 7/16 DIN and N connectors don't have any funny notches to deal with, but they do have torque specifications for installation, in case anyone wondered.

Do Something!

Whether you choose to apply the full multilayer treatment or not, please do *something* to protect your connectors. Even a quick wrap of vinyl tape will help to shed the rain and keep out the grit. You'll appreciate that later when you need to service them.

References

Commscope weatherproofing accessories:
https://www.commscope.com/product-type/structural-support-tools-accessories/weatherproofing-accessories/

Commscope weatherproofing kit installation procedure:
https://www.commscope.com/globalassets/digizuite/57909-sp50375-b.pdf?r=1

DX Engineering, "Weatherproofing Coaxial Cable Connections"

https://static.dxengineering.com/global/images/instructions/weatherproofingtectip-rev2a.pdf

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Editor Notes

The ARRL Sweepstakes CW will be history by the time you read this issue, SSB is 15 Nov. SS is the “grandfather” [or close] of contests. It began somewhat informally and required the exchange of radiograms. It originally ran over a period of 2 weeks or so. In the 50's it signaled the beginning of what was euphemistically called “winter” in Los Angeles. The “big deal” with SS is that you can work a station once, regardless of band. Near the end of the last century, NCCC capitalized on an idea from Rusty, W6OAT, to win the SS Gavel several years in a row. It presented some logistical challenges and took several years for others to figure it out. The growth of remote operation has mostly moved Rusty's “Highly Motivated Operator” into history, but for those who remember, it was a heady time.

HV Farads For Sale

Planning to shunt-load a tower? Build a big tube amp? Design a QRO phasing network? Then check this list of vacuum variable and high-voltage (a.k.a. doorknob) capacitors. Suggested prices are VERY reasonable **and are negotiable**. All proceeds go to Garry Shapiro, NI6T, who is very ill. Photos available on request. Please contact me off-list.

Gary NA6O *gwj@me.com*

Vacuum Variables, $100 ea

Jennings GCS-100-7.5S 5-100 pF, 7500 V. Small gear on end of shaft
Jennings USLS-465-5DI542, 5-465 pF, 5 kV at max cap.
Jennings USL-500, 7-500 pF, bare shaft.
Jennings USL-500, 7-500 pF, with full gear train with limit switches, 24 VDC motor, and 15-pin connector. Very nice assembly! $120 for this one.

High-Voltage Ceramic Doorknobs $5 ea

4ea Sprague 500p 20kV doorknob
5ea 100p 5kV N750 doorknob
2ea 1500p 20kV N4700 doorknob
1ea 200p 7.5kV doorknob
1ea Sprague 715C .011 6kV doorknob

Other High-Voltage Capacitors $1 ea

5ea 1500p 6kV disc ceramic
8ea 3300p 3kV disc ceramic
3ea 4700p 4kV disc ceramic
1ea .002 10kV disc ceramic
1ea Sprague Vitamin Q .005 6.5kV cylindrical, glass
1ea Plastic Cap Corp HG70-502 .005 7kV cylindrical, glass

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2ea Sangamo type A2 600p 2500 WVDC flat transmitting mica

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NS CW Ladder: Bill Haddon, N6ZFO/4 *n6zfo@arrl.net*
Tim Shoppa *tshoppa@gmail.com*
FT4/8 Sprint: Dennis W1UE *egan.dennis88@gmail.com*

Communications
Webmaster: John Miller, K6MM

NCCC Membership Information

If you wish to join NCCC, please fill out an application for membership, which will be read and voted upon at our monthly meeting. To join, you must reside within club territory which is defined as everything in California north of the Tehachapi's up to the Oregon state line, and part of northwestern Nevada (anything within our ARRL 175-mile radius circle centered at 10 miles north of Auburn on Highway 49).

Life Memberships

Life memberships are $250.00 Contact secretary.nccc@gmail.com. Members who have reached 80 years of age have and been an NCCC member for 20 or more years are eligible for Honorary Life Membership ("80/20 Rule"). Contact secretary.nccc@gmail.com

radiosport.world/ladder

JUG Articles Wanted!

Please consider submitting an article! The preferred format is plain, unformatted ASCII text MS Word (.doc/.docx) are acceptable, Pictures should be as high a resolution as available. Please do not spend time formatting your submittal, the templates will re-format everything. Send your material to *k6dgwnv@gmail.com*

Northern California Contest Club Reflector—Guidelines

The NCCC email reflector is devoted to the discussion of contesting. Topics include contests, station building, dxpeditions, technical questions, contesting questions, amateur radio equipment wants/sales, score posting, amateur radio meetings/

conventions, and membership achievements. Postings may not include personal attacks, politics, or off-subject posts. Such postings will be considered a violation of the Guidelines

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NCCC Lands’ End Store

We are pleased to announce that the new NCCC Land’s End store is online! You can choose from an array of shirts, jackets, and hats and apply your choice of custom-embroidered NCCC logos: A plain one, or one that also says Fifty Years. And, you can personalize your item by adding your name and/or call sign. The store is open 24/7 and items are shipped directly to you. No more waiting for everyone else to make up their minds on a group purchase.

https://business.landsend.com/store/nccc/ or from the NCCC website: http://nccc.ccc/members/lestore.html Thanks to W6TCP for helping to set this up. Instructions for purchases from Lands’ End NCCC Store

1. Go to https://business.landsend.com/store/nccc/
2. Click on Men’s or Women’s link, then choose item(s)
3. Pick color, inter quantity of each size you want to order.
4. Click Apply Logos and Personalizations. This will display the logo choices. Try them out. It will show you what they look like on your chosen fabric color.
5. Select a location for logo (left side, ride side, back, etc)
6. Click Apply Logo.
7. Optionally, click Add Personalization to add your name or call sign ($8.00, 10 character limit)
8. Click Add to Bag and Continue Shopping or.

   Start Secure Check out. Account creation and credit card required.

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Modular, hybrid architecture adapts to your needs

The basic K4 covers 160-6 m, with dual receive on the same or different bands. The K4D adds diversity receive, with a full set of band-pass filters for the second receiver. (Thanks to direct RF sampling, there's no need for crystal filters in either the K4 or K4D.) The K4HD adds a dual superhet module for extreme-signal environments. Any K4 model can be upgraded to the next level, and future enhancements–such as a planned internal VHF/UHF module–can be added as needed.

Single or dual panadapter, plus a high-resolution tuning aid

The main panadapter can be set up as single or dual. Separate from the main panadapter is our per-receiver *mini-pan* tuning aid, with a resampled bandwidth as narrow as +/- 1 kHz. You can turn it on by tapping either receiver's S-meter or by tapping on a signal of interest, then easily auto-spot or fine tune to the signal.

Comprehensive I/O, plus full remote control

The K4's rear panel includes all the analog and digital I/O you'll ever need. All K-line accessories are supported, including amps, ATUs, and our K-Pod controller. The Video output can mirror the K4 screen or display a high-res Panadapter only screen. Via Ethernet, the K4 can be 100% remote controlled from a PC, notebook, tablet, or even another K4, with panadapter data included in all remote displays. Work the world from anywhere–in style!

K4 KEY FEATURES

- Optimized for ease of use
- Modular, upgradeable design
- 7" color screen with touch and mouse control
- ATU with 10:1+ range, 3 antenna jacks
- Up to 5 receive antenna sources
- Full remote control via Ethernet

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